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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/769,923	OH, KWANG-HO	
	Examiner	Art Unit	
	DeWanda Samuel	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *03 February 2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. **Claims 1-3 and 5-8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiota (US Patent 6,987,762) in view of Yoon et al. (US Patent 7,006,504).

With regard to claim 1, Shiota discloses having *a label switching router having an internal channel share function over an asynchronous transfer mode,* Shiota discloses having a label switch router (LSR) 1 in fig. 2 also in fig. 1 illustrate an shared internal channel function.

comprising: an ingress forwarding engine adapted to set up a label switched path by using a signaling protocol, extract an egress forwarding engine number and an internal channel identifier, allocate an extension tag, search a previously-set internal channel, form a forwarding information base/label information base comprising the previously-set internal channel identifier and the extension tag, add a header having the internal channel identifier and extension tag to a received internet protocol packet by referring to the forwarding information base/label information base, and forward the internet protocol packet; Shiota discloses having an input unit which includes a forwarding engine ("ingress forwarding engine") in fig. 2 (column 8 line 60 –67). Shiota further discloses that a control signal for setting label information on the LSR (label switch router) is served by using an LDP (Label Distribution Protocol, "signaling protocol")...packets are received from the lines to the header to header controller 7, together with input line number, while receiving the packets and extracting the header information therefrom (column 9 line 34-37). It is inferred that the header may contain information about the egress router that sent the packet and its channel information.

However, Shiota does not explicitly discloses extract an egress forwarding engine number and an internal channel identifier, allocate an extension tag, search a previously-set internal channel, form a forwarding information base/label information base comprising the previously-set internal channel identifier and the extension tag, add a header having the internal channel

identifier and extension tag to a received internet protocol packet by referring to the forwarding information base/label information base, and forward the internet protocol packet. Yoon et al. discloses having an apparatus for merging virtual connection in a LSR (label switching router) of an MPLS (Multiprotocol Label Switching, column 3 line 52-56). Yoon et al. further discloses a label is used to distinguish each channel on a MPLS network, a VPI (Virtual Path Identification) or VCI (Virtual Channel Identification) value in ATM (Asynchronous Transfer Mode, column 1 line 23-26). In addition, Yoon et al. discloses LSR receiving data having TSAR (Transmission Segmentation and Reassembly) channel identifier and RSAR (Reception Segmentation and Reassembly) channel identifier of the egress connection ("internal channel identifiers", column 6). Yoon et al. discloses having an egress connection label ("egress forwarding engine number") being received by the RSAR (column 9 line 31-41)...a channel handle (CH) is attached to the egress connection information ("allocate an extension tag," fig. 9 and column 7 line 8-12)...egress channel identifier are registered in a lookup memory 60 ("search a previously-set internal channel", column 10 line 64-67)...in fig. 3 it is discloses the header with a the channel identifiers and channel handle ("extension tag").

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have a label switch router 1 as taught by Shiota with a apparatus for merging virtual connection as taught by Yoon et al. to provide a mechanism that will provide internal virtual connections within a shared channel.

and a merging unit adapted to receive label switched path set information from a peer forwarding engine, form an extension information base/merging table where an internal channel identifier is mapped to an extension tag, perform merging when receiving an internet protocol packet having the extension tag, extract the extension tag, mapping the extension tag to the internal channel identifier, and forward the internet protocol packet to an internal channel having the mapped internal channel identifier; Shiota discloses having a merge unit 16 in fig. 2 . However, Shiota does not disclose adapted to receive label switched path set information from a peer forwarding engine, form an extension information base/merging table where an internal channel identifier is mapped to an extension tag, perform merging when receiving an internet protocol packet having the extension tag, extract the extension tag, mapping the extension tag to the internal channel identifier, and forward the internet protocol packet to an internal channel having the mapped internal channel identifier. Yoon et al. discloses having an apparatus for merging virtual connection in a LSR (label switching router) of an MPLS (Multiprotocol Label Switching, column 3 line 52-56). Yoon et al. further discloses a label is used to distinguish each channel on a MPLS network, a VPI (Virtual Path Identification) or VCI (Virtual Channel Identification) value in ATM (Asynchronous Transfer Mode, column 1 line 23-26).

In addition, Yoon et al. discloses LSR receiving data having TSAR (Transmission Segmentation and Reassembly) channel identifier and RSAR (Reception Segmentation and Reassembly) channel identifier ("channel

identifiers") of the egress connection ("internal channel identifier", column 6). Yoon et al. discloses having an egress connection label ("egress forwarding engine number") being received by the RSAR (column 9 line 31-41)...a channel handle (CH) is attached to the egress connection information ("allocate an extension tag," fig. 9 and column 7 line 8-12)...egress channel identifier are registered in a lookup memory 60 ("search a previously-set internal channel", column 10 line 64-67)...in fig. 3 it is discloses the header with a the channel identifiers and channel handle ("extension tag").

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have a label switch router 1 as taught by Shiota with a apparatus for merging virtual connection as taught by Yoon et al. to provide a mechanism that will provide internal virtual connections within a shared channel.

With regard to claim 2, in combination Shiota and Yoon et al. teaches the label switching router recited in claim 1. *The forwarding engine being controlled by a main control unit, the main control unit being programmed and configured to set up the label switched path by using the signaling protocol, extract the egress forwarding engine number and the internal channel identifier stored in the forwarding information base/label information base, allocate the extension tag according to the set label switched path, and store the internal channel identifier and the allocated extension tag in the forwarding information base/label information base,* Shiota discloses having a forwarding engine 10 in

fig. 2 ...also a control signal for setting label information on the LSR (label switch router) is served by using an LDP (label distribution protocol "signaling protocol", column 1 line 43-46).

However, Shiota does not disclose the forwarding engine being controlled by a main control unit, the main control unit being programmed and configured to set up the label switched path by using the signaling protocol, extract the egress forwarding engine number and the internal channel identifier stored in the forwarding information base/label information base, allocate the extension tag according to the set label switched path, and store the internal channel identifier and the allocated extension tag in the forwarding information base/label information base. Yoon discloses having a host 20 receives an order of establishing or terminating a connection from a central controller 10 ("main control unit") that manages connection of ingress or egress and controls each function block in a LSR system (column 6 line 36-39). Yoon et al. further discloses a label is used to distinguish each channel on a MPLS network, a VPI (Virtual Path Identification) or VCI (Virtual Channel Identification) value in ATM (Asynchronous Transfer Mode, column 1 line 23-26). In addition, Yoon et al. discloses LSR receiving data having TSAR (Transmission Segmentation and Reassembly) channel identifier and RSAR (Reception Segmentation and Reassembly) channel identifier ("channel identifiers") of the egress connection ("internal channel identifier", column 6). Yoon et al. discloses having an egress connection label ("egress forwarding engine number") being received by the RSAR (column 9 line 31-41)...a channel handle (CH) is attached to the egress

connection information ("allocate an extension tag," fig. 9 and column 7 line 8-12)...egress channel identifier are registered in a lookup memory 60 ("search a previously-set internal channel", column 10 line 64-67)...in fig. 3 it is discloses the header with a the channel identifiers and channel handle ("extension tag"). It is inferred that the central controller have the ability to control all the units that are used for the merging process.

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have a forward engine 10 as taught by Shiota controlled by a central controller 10 as taught by Yoon et al. to provide a mechanism that will control each function block of the LSR system (.label switch router).

wherein the forwarding engine comprises: the forwarding information base/label information base for storing and managing a destination internet protocol address, the internal channel identifier, the extension tag and a label; Shiota discloses having a forwarding engine 10 in fig. 1.Hwever, Shiota does not discloses the forwarding engine comprises: the forwarding information base/label information base for storing and managing a destination internet protocol address, the internal channel identifier, the extension tag and a label. Yoon et al. discloses having a host 20 receives orders of establishing or terminating a connection from a central controller 10, manages connections of ingress or egress and controls each function block in an LSR system (column 6 line 36-39)... the host stores reception channel handles and connections parameters

(column 6 line 65-67). It is inferred that the host have the capabilities to store connection parameters which a may include labels identifiers tags and destination addresses.

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have a label switch router 1 as taught by Shiota with a host 20 as taught by Yoon et al. to advantageously provide a storage for forwarding information used in labeling and transmitting packets.

Shiota does not discloses having *an SAR receiving unit for reassembling the received internet protocol packet and outputting the reassembled internet protocol packet ; a lookup control unit for adding the header having the internal channel identifier, the extension tag and the label to the internet protocol packet by referring to the forwarding information base/label information base, and outputting the internet protocol packet; and an SAR transmitting unit receiving the internet protocol packet having the internal channel identifier and the extension tag from the lookup control unit, confirming the internal channel identifier, and forwarding the internet protocol packet to the internal channel identifier;* Yoon et al. discloses having a SAR (Receiving Segmentation and Reassembly) device which includes a the RSAR and the TSAR (Transmission Segmentation and Reassembly) process AAL5 frames(column 3 line 29-39)...in fig.1 within the RSAR unit is a frame reassembling unit (fig. 1). Yoon further discloses HCL 40

("lookup control unit") in fig.1 receiving data having a payload and further processes the data (column 6 line 44-58).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have a label switch router 1 as taught by Shiota with a SAR (Receiving Segmentation and Reassembly) device as taught by Yoon et al. to provide a mechanism that that will segment large packets into smaller packets to achieve compatibility with a network protocol.

With regard to claim 3, in combination Shiota and Yoon et al. teaches the label switching router recited in claim 1.*The merging unit being controlled by a main control unit, the main control unit being programmed and configured to receive the label switched path set information from the peer forwarding engine, and form the extension information base/merging table where the internal channel identifier is mapped to the extension tag,* Shiota discloses having a merge unit 16 in fig. 2.

However, Shiota does not disclose adapted to receive label switched path set information from a peer forwarding engine, form an extension information base/merging table where an internal channel identifier is mapped to an extension tag, perform merging when receiving an internet protocol packet having the extension tag, extract the extension tag, mapping the extension tag to the internal channel identifier, and forward the internet protocol packet to an internal channel having the mapped internal channel identifier. Yoon et al. discloses having an apparatus for merging virtual connection in a LSR (label

switching router) of an MPLS (Multiprotocol Label Switching, column 3 line 52-56).

Yoon et al. further discloses a label is used to distinguish each channel on a MPLS network, a VPI (Virtual Path Identification) or VCI (Virtual Channel Identification) value in ATM (Asynchronous Transfer Mode, column 1 line 23-26). In addition, Yoon et al. discloses LSR receiving data having TSAR (Transmission Segmentation and Reassembly) channel identifier and RSAR (Reception Segmentation and Reassembly) channel identifier ("channel identifiers") of the egress connection ("internal channel identifier", column 6). Yoon et al. discloses having an egress connection label ("egress forwarding engine number") being received by the RSAR (column 9 line 31-41)...a channel handle (CH) is attached to the egress connection information ("allocate an extension tag," fig. 9 and column 7 line 8-12)...egress channel identifier are registered in a lookup memory 60 ("search a previously-set internal channel", column 10 line 64-67)...in fig. 3 it is discloses the header with a the channel identifiers and channel handle ("extension tag").

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have a label switch router 1 as taught by Shiota with a apparatus for merging virtual connection as taught by Yoon et al. to provide a mechanism that will provide internal virtual connections within a shared channel.

wherein the merging unit comprises: an extension information base/merging table mapping the internal channel identifier to the extension tag, and storing the mapped internal channel identifier; Shiota discloses having a merge unit. However, Shiota does not explicitly disclose having an extension information base/merging table mapping the internal channel identifier to the extension tag, and storing the mapped internal channel identifier. Yoon et al. discloses having a VC merging apparatus in a LSR (label switching router) system

an SAR receiving unit reassembling the received IP packet, and outputting the reassembled internet protocol packet; a lookup control unit programmed and configured to add the header having the internal channel identifier mapped to the extension tag to the internet protocol packet by referring to the forwarding information base/label information base, and output the internet protocol packet; and an SAR transmitting unit confirming the internal channel identifier in the lookup control unit, and forwarding the internet protocol packet to the internal channel identifier. Yoon et al. discloses having a SAR (Receiving Segmentation and Reassembly) device which includes a the RSAR and the TSAR (Transmission Segmentation and Reassembly) process AAL5 frames(column 3 line 29-39)...in fig.1 within the RSAR unit is a frame reassembling unit (fig. 1). Yoon further discloses HCL 40 ("lookup control unit") in fig.1 receiving data having a payload and further processes the data (column 6 line 44-58).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have a label switch router 1 as taught by Shiota with a SAR (Receiving Segmentation and Reassembly) device as taught by Yoon et al. to provide a mechanism that that will segment large packets into smaller packets to achieve compatibility with a network protocol.

With regard to claim 5, in combination Shiota and Yoon et al. teaches the label switching router recited in claim 1. *Wherein packets originating from different sources and going to a common destination handled by the router are transferred to said common destination via a single channel.* Shiota discloses plurality of packets originating from different sources being sent to opposite devices (fig. 1 and column 8 line 40-44). However, Shiota does not explicitly discloses packets originating from different sources and going to a common destination handled by the router are transferred to said common destination via a single channel. Yoon et al. discloses having a procedure of establishing a leaf connection where the ingress and the egress connections have the same label value (e.g. channel handle (column 1 line 52-53). That is a virtual ingress connection A is requested to be added to the multi point-to-point connection as a new leaf where the two ingress connections B and C are connected to the egress B. Here three connections A, B, and C are established in the RSAR 30 and the TSAR 50, respectively, and the HCIL 40 maps the ingress connections A, B, C of the RSAR 30 to the egress connection B of the TSAR ("only one internal

channel", column 8 line 44-53).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have a label switch router 1 as taught by Shiota with a VC connection procedure as taught by Yoon et al. to provide a mechanism that will establish connection in shared channel.

With regard to claim 6, in combination Shiota and Yoon et al. teaches the label switching router recited in claim 1. *The router of claim 5, said single channel is shared by packets from different sources to transmit packets to said common destination.* Shiota discloses plurality of packets originating from different sources being sent to opposite devices (fig. 1 and column 8 line 40-44). However, Shiota does not explicitly discloses packets originating from different sources and going to a common destination handled by the router are transferred to said common destination via a single channel. Yoon et al. discloses having a procedure of establishing a leaf connection where the ingress and the egress connections have the same label value (e.g. channel handle (column 1 line 52-53). That is a virtual ingress connection A is requested to be added to the multi point-to-point connection as a new leaf where the two ingress connections B and C are connected to the egress B . Here three connections A, B, and C are established in the RSAR 30 and the TSAR 50, respectively; and the HCIL 40 maps the ingress connections A, B, C of the RSAR 30 to the egress connection

B of the TSAR ("only one internal channel", column 8 line 44-53).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have a label switch router 1 as taught by Shiota with a VC connection procedure as taught by Yoon et al. to provide a mechanism that will establish connection in shared channel.

With regard to claim 7, in combination Shiota and Yoon et al. teaches the label switching router recited in claim 1. *wherein only one internal channel is used to deliver packets to a given destination handled by said router.* Shiota discloses pluratiy of packets originating from different sources being sent to opposite devices (fig. 1 and column 8 line 40-44). However, Shiota does not explicitly discloses packets originating from different sources and going to a common destination handled by the router are transferred to said common destination via a single channel. Yoon et al. discloses having a procedure of establishing a leaf connection where the ingress and the egress connections have the same label value (e.g. channel handle (column 1 line 52-53). That is a virtual ingress connection A is requested to be added to the multi point-to-point connection as a new leaf where the two ingress connections B and C are connected to the egress B . Here three connections A, B, and C are established in the RSAR 30 and the TSAR 50, respectively, and the HCIL 40 maps the ingress connections A, B, C of the RSAR 30 to the egress connection B of the

TSAR ("only one internal channel", column 8 line 44-53).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have a label switch router 1 as taught by Shiota with a VC connection procedure as taught by Yoon et al. to provide a mechanism that will establish connection in shared channel.

With regard to claim 8, in combination Shiota and Yoon et al. teaches the label switching router recited in claim 1.*where only one internal channel is used to handle all packets of said router having a common extension tag.* Shiota discloses pluratiy of packets originating from different sources being sent to opposite devices (fig. 1 and column 8 line 40-44). However, Shiota does not explicitly discloses packets originating from different sources and going to a common destination handled by the router are transferred to said common destination via a single channel. Yoon et al. discloses having a procedure of establishing a leaf connection where the ingress and the egress connections have the same label value (e.g. channel handle (column 1 line 52-53). That is a virtual ingress connection A is requested to be added to the multi point-to-point connection as a new leaf where the two ingress connections B and C are connected to the egress B . Here three connections A, B, and C are established in the RSAR 30 and the TSAR 50, respectively, and the HCIL 40 maps the ingress connections A, B, C of the RSAR 30 to the egress connection B of the

TSAR ("only one internal channel", column 8 line 44-53).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have a label switch router 1 as taught by Shiota with a VC connection procedure as taught by Yoon et al. to provide a mechanism that will establish connection in shared channel.

4. **Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over Shiota (US Patent 6,987,762) and Yoon et al. (US Patent 7,006,504). as applied to claim 1 above, and further in view of Reeves et al. (US Patent 7,197,033).

With regard to claim 4, in combination Shiota and Yoon et al. teaches the label switching router recited in claim 1. *the extension tag being indicative of a destination IP address from the merging unit.* Shiota discloses having a merge unit 16 in fig. 1. However, Shiota does not discloses having a extension tag being indicative of a destination IP address from the merging unit. Reeves et al. discloses having IP router 10 (column 6 line 52-53) ...a FEC ("extentsion tag") which is a IP destination for an LSP (abel switch path)...FEC consists of an IP destionation address 112b and a prefix 112c for which the LSP is destined (column 12 line 46-48).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have a label switch router 1 with a merge unit 16 as taught by Shiota with a FEC ("extentsion tag") which is a IP destination for an LSP (label switch path) as taught by Reeves et al. to provide a mechanism that will connect LSP (label switch paths).

5. Claims 9-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoon et al. (US patent 7,006,504) in view of Reeves et al. (US Patent 7,197,033).

With regard to claim 9, Yoon et al. discloses having *a method for sharing an internal channel by using a label switching router over an asynchronous transfer mode,* Yoon et al. discloses having a VC merging apparatus within a LSR (Label Switching Router, column 3 line 52-55)...over ATM (column 1 line 23-27).

the method comprising: setting up a label switched path by using a signaling protocol, extracting an egress forwarding engine number and a channel identifier, allocating an extension tag, and forming a forwarding information base/label information base by using a previously-set internal channel by an ingress forwarding engine; Yoon et al. discloses having a connection establishment ("label switch path") method of a VC merging apparatus in a LSR (Label Switching Router) system (column 4 line 19-31)... the TSAR segmentation unit

51 receives data having a TSAR channel identifier ("channel identifier") of egress connection as a header from the HCIL 40, and is transmitted with egress connection labels 215,207 and connection parameters from the TASR memory by using a TSAR channel identifier 213 of the egress connection as address (column 7 line 35-43)...a channel handle is attached to header of the ATM cell pay load (column 7 line 8-11)...the HCIL 40 receives data from the RSAR 30 and reads TSAR channel identifiers 205, 213 from the lookup memory 60 by using ingress channel handles 203, 211 as an address, thereby transmitting the data having the TSAR channel identifiers 205,212 of the egress connection and the payloads 204, 212 received from the RSAR 30 as a header to the TSAR 50 (column 7 line 26-33). However, Yoon et al. does not explicitly disclose setting up a label switched path by using a signaling protocol. Reeves discloses the router with signaling logic ("signaling protocol", column 4 line 21-24).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have a VC (virtual connection) merging apparatus in a LSR (label switching router) system as taught by Yoon et al. with signaling logic as taught by Reeves et al. to communicate to each of the neighboring routers.

adding a header having the internal channel identifier and extension tag to a received internet protocol packet by referring to the forwarding information base/label information base, and forwarding the internet protocol packet by the

forwarding engine; Yoon et al. discloses the HCIL 40 converts data headers transmitted form the RSAR 30...the header conversion provides a function of mapping header in formation for multi point-to-point (VC merging)

receiving label switched path set information from a peer forwarding engine, and forming an extension information base/merging table where an internal channel identifier is mapped in an extension tag at a merging unit; Yoon et al. disclose that the HCIL 40 receives data from the RSAR 30 and reads TSAR channel identifiers 205, 213 from the lookup memory 60 by using ingress channel handles 203, 211 as an address, thereby transmitting the data having the TSAR channel identifiers 205,212 of the egress connection and the payloads 204, 212 received from the RSAR 30 as a header to the TSAR 50 (column 7 line 26-33). It is inferred

and forwarding a received internet protocol packet having the extension tag to an internal channel having the internal channel identifier mapped to the extension tag by referring to the extension information base/merging table at the merging unit. Yoon et al. discloses the procedure of connection establishment begins with the central controller 10 requesting to establish a connection to the host 20 by using ingress connection labels, egress connection labels, and connection parameters...the connection is a VC merging connection (column 8 line 1-15)...the host transmit connections parameters, egress connection labels and egress channel handles to the TSAR 50 requesting to establish a

connection...using the ingress channel handle ("extension tag") as an address , a TSAR channel identifier of the egress connection is registered in the lookup memory 60 (column 9 line 42-67).

With regard to claim 10, in combination Yoon et al. and Reeves et al. teaches the method recited in claim 9. *wherein the setting up a label switched path by using a signaling protocol, extracting an egress forwarding engine number and a channel identifier, allocating an extension tag, and forming a forwarding information base/label information base by using a previously-set internal channel by an ingress forwarding engine;* Yoon et al. discloses having a connection establishment ("label switch path") method of a VC merging apparatus in a LSR (Label Switching Router) system (column 4 line 19-31)... the TSAR segmentation unit 51 receives data having a TSAR channel identifier ("channel identifier") of egress connection as a header from the HCIL 40, and is transmitted with egress connection labels 215,207 and connection parameters from the TASR memory by using a TSAR channel identifier 213 of the egress connection as address (column 7 line 35-43)... channel handle is attached to header of the ATM cell pay load (column 7 line 8-11)...the HCIL 40 ("forwarding information base/label information base") receives data from the RSAR 30 and reads TSAR channel identifiers 205, 213 from the lookup memory 60 by using ingress channel handles 203, 211 as an address, thereby transmitting the data having the TSAR channel identifiers 205,212 of the egress connection and the

payloads 204, 212 received from the RSAR 30 as a header to the TSAR 50 (column 7 line 26-33). Yoon et al. further discloses having an egress connection label ("egress forwarding engine number") being received by the RSAR (column 9 line 31-41). However, Yoon et al. does not explicitly disclose setting up a label switched path by using a signaling protocol. Reeves discloses the router with signaling logic ("signaling protocol", column 4 line 21-24).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have a VC (virtual connection) merging apparatus in a LSR (label switching router) system as taught by Yoon et al. with signaling logic as taught by Reeves et al. to communicate to each of the neighboring routers.

step comprises: setting up the label switched path by using the signaling protocol; extracting the egress forwarding engine number and the channel identifier, and allocating the extension tag; and searching the previously-set internal channel, and forming the forwarding information base/label information base having the previously-set internal channel identifier and the extension tag. Yoon et al. discloses having a connection establishment ("label switch path") method of a VC merging apparatus in a LSR (Label Switching Router) system (column 4 line 19-31)... the TSAR segmentation unit 51 receives data having a TSAR channel identifier ("channel identifier") of egress connection as a header from the HCIL 40, and is transmitted with egress connection labels 215,207 and connection parameters from the TASR memory by using a TSAR channel

identifier 213 of the egress connection as address (column 7 line 35-43)... channel handle is attached to header of the ATM cell pay load (column 7 line 8-11)...the HCIL 40 ("forwarding information base/label information base") receives data from the RSAR 30 and reads TSAR channel identifiers 205, 213 from the lookup memory 60 by using ingress channel handles 203, 211 as an address, thereby transmitting the data having the TSAR channel identifiers 205,212 of the egress connection and the payloads 204, 212 received from the RSAR 30 as a header to the TSAR 50 (column 7 line 26-33). Yoon et al. further discloses having an egress connection label ("egress forwarding engine number") being received by the RSAR (column 9 line 31-41). However, Yoon et al. does not explicitly disclose setting up a label switched path by using a signaling protocol. Reeves discloses the router with signaling logic ("signaling protocol", column 4 line 21-24).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have a VC (virtual connection) merging apparatus in a LSR (label switching router) system as taught by Yoon et al. with signaling logic as taught by Reeves et al. to communicate to each of the neighboring routers.

With regard to claim 11, in combination Yoon et al. and Reeves et al. teaches the method recited in claim 9. *wherein the adding a header having the internal channel identifier and extension tag to a received internet protocol packet by referring to the forwarding information base/label information base, and*

forwarding the internet protocol packet by the forwarding engine; Yoon et al. discloses having a SAR device that includes a RSAR (Receiving Segmentation and Reassembly) unit with a SAR device . Yoon further discloses outputs data having payload and channel identifier as (column 1 line 33-38 and fig 1)...also attaches a channel handle (CH) to the header of AAL5 payload 202 ("received internet protocol packet") and transmit them to the HCIL 40 (column 7 line 1-12).

step comprises: reassembling the received IP packet, and outputting the reassembled internet protocol packet; Yoon et al. discloses having a SAR device that includes a RSAR (Receiving Segmentation and Reassembly) outputs data having payload and channel identifier as (column 1 line 33-38 and fig 1).

adding the header having the internal channel identifier, the extension tag and the label to the internet protocol packet by referring to the forwarding information base/label information base ; and confirming the internal channel identifier, and forwarding the internet protocol packet to the internal channel identifier. Yoon et al. discloses having a SAR device that includes a RSAR (Receiving Segmentation and Reassembly) unit with a SAR device . Yoon further discloses the frame assembly unit 31 receives ATM cells from upstream and with the ingress channel handles and the connection parameters, it is transmitted from the RSAR control memory 32 by using the labels of VPI/VCI as an address (column 7 line 1-6)...outputs data having payload and channel identifier as (column 1 line 33-38 and fig 1)...also attaches a channel handle (CH) to the

header of AAL5 payload 202 ("received internet protocol packet") and transmit them to the HCIL 40 (column 7 line 1-12)...the HCIL 40 converts data headers transmitted from

With regard to claim 12, in combination Yoon et al. and Reeves et al. teaches the method recited in claim 9. *wherein the forwarding a received internet protocol packet having the extension tag to an internal channel having the internal channel identifier mapped to the extension tag by referring to the extension information base/merging table at the merging unit;* Yoon et al. discloses having a VC merging unit in fig.1. Yoon et al. further discloses the RSAR attaches a CH (channel handle, "extension tag") value to a retrieved AAL5 frame ("internet protocol packet") payload (column 1 line 54-55)...and transmit them to the HCIL 40...the HCIL 40 converts the data headers transmitted from the RSAR 30...the header conversion provides a function of mapping header information for multi point-to-point (VC merging)...also the HCIL 40 receives data from the RSAR 30 and reads TSAR channel identifiers 205, 213 from the lookup memory 60 ("information base/merging table") by using ingress channel handles 203, 211 as addresses (column 7 line 8-32).
step comprises: performing merging when an internet protocol packet having the extension tag is received; extracting the extension tag, and mapping it to the internal channel; and forwarding the internet protocol packet to the internal channel having the mapped internal channel identifier. Yoon et al. discloses the RSAR attaches a CH (channel handle, "extension tag") value to a retrieved AAL5

frame ('internet protocol packet") payload (column 1 line 54-55)...and transmit them to the HCIL 40...the HCIL 40 converts the data headers transmitted from the RSAR 30...the header conversion provides a function of mapping header information for multi point-to-point (VC merging)...also the HCIL 40 receives data from the RSAR 30 and reads TSAR channel identifiers 205, 213 from the lookup memory 60 ("information base/merging table") by using ingress channel handles 203, 211 as addresses, thereby transmitting the data having the TSAR channel identifiers 205, 213 of the egress connection and the payload 204, 212 received from the RSAR 300as a header to the TSAR 50 (column 7 line 8-32). Yoon et al. further discloses procedures of establishing a multi –point-to-point (VC merging) connections (column 8 line 1-67).

With regard to claim 13, in combination Yoon et al. and Reeves et al. teaches the method recited in claim 9.*the extension tag being indicative of the internal channel the internet protocol packet is forwarded to from the merging unit.* Yoon et al. discloses having a channel handle is what a local host uses in substitute for label values...also, RSAR attaches a CH value ("extension tag") to retrieved AAL5 frame payload as its over-header, thereby identifying each channel of data outputted outside. In addition, also having a egress channel handle which is a CH value ("extension tag") of egress connection and a ingress channel handle which is also a CH value ("extension tag") of a ingress connection (column 1 line 52-59).

With regard to claim 14, in combination Yoon et al. and Reeves et al. teaches the method recited in claim 9. *only one internal channel is used to deliver all packets to a common destination.* Yoon et al. discloses having a procedure of establishing a route connection where the ingress connection label is equal to the egress connection label. That is the ingress connection and the egress connection have the same label B. A single connection B is established in the RSAR 30 and the TSAR 50 and the HCIL 40 maps the ingress connection B of the RSAR 30 to the egress connection B of the TSAR 50 (column 8 line 24-31).

With regard to claim 15 in combination Yoon et al. and Reeves et al. teaches the method recited in claim 9. *only one internal channel is set up to deliver packets having a common extension tag.* Yoon et al. discloses having a procedure of establishing a leaf connection where the ingress and the egress connections have the same label value (e.g. channel handle (column 1 line 52-53). That is a virtual ingress connection A is requested to be added to the multi point-to-point connection as a new leaf where the two ingress connections B and C are connected to the egress B . Here three connections A, B, and C are established in the RSAR 30 and the TSAR 50, respectively, and the HCIL 40 maps the ingress connections A, B, C of the RSAR 30 to the egress connection B of the TSAR ("only one internal channel", column 8 line 44-53).

With regard to claim 16, in combination Yoon et al. and Reeves et al. teaches the method recited in claim 9. *only one channel is used to deliver packets to a single destination even when the packets originate from diverse forwarding engines in the label switching router.* Yoon et al. discloses having a procedure of establishing a leaf connection where the ingress and the egress connections have the same label value (e.g. channel handle (column 1 line 52-53). That is a virtual ingress connection A is requested to be added to the multi point-to-point connection as a new leaf where the two ingress connections B and C are connected to the egress B . Here three connections A, B, and C are established in the RSAR 30 and the TSAR 50, respectively, and the HCIL 40 maps the ingress connections A, B, C of the RSAR 30 to the egress connection B of the TSAR ("only one internal channel", column 8 line 44-53).

With regard to claim 17, in combination Yoon et al. and Reeves et al. teaches the method recited in claim 9. *only one internal channel is set up and serves as an only path to deliver packets from a plurality of forwarding engines in the label switching router to a single destination in the label switching router.* Yoon et al. discloses having a procedure of establishing a leaf connection where the ingress and the egress connections have the same label value (e.g. channel handle (column 1 line 52-53). That is a virtual ingress connection A is requested to be added to the multi point-to-point connection as a new leaf where the two ingress connections B and C are connected to the egress B. Here three connections A, B, and C are established in the RSAR 30 and the TSAR 50,

respectively, and the HCIL 40 maps the ingress connections A, B, C of the RSAR 30 to the egress connection B of the TSAR ("only one internal channel", column 8 line 44-53).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DeWanda Samuel whose telephone number is (571) 270-1213. The examiner can normally be reached on Monday-Thursday 8:30-5:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Q. Ngo can be reached on (571) 272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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DeWanda Samuel
6/29/2007

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